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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,527	03/17/2004	David A. Litton	EH-10433B(02-217-2)	5484
34704	7590	12/12/2005	EXAMINER	
BACHMAN & LAPOINTE, P.C. 900 CHAPEL STREET SUITE 1201 NEW HAVEN, CT 06510			MCNEIL, JENNIFER C	
			ART UNIT	PAPER NUMBER
			1775	

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/803,527

Applicant(s)

LITTON ET AL

Examiner

Jennifer C. McNeil

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-10 and 14-55 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5, 7-10, 15-17, 19-21, 27, 29, 44, 45 and 47-55 is/are allowed.
- 6) ☒ Claim(s) 14, 18, 22-26, 28, 30-43, 46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

Claims 1 and 36 are objected to because of the following informalities: Claim 1, lines 2-3, "select ed" should be one word. Claim 36, line 9, "zirconis" is misspelled. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14, 18, and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 14 and 18 lack antecedent basis for "said at least one lanthanide sesquioxide". For examination, the claims have been interpreted as containing the subject matter of "at least 15 mol% of at least one lanthanide sesquioxide".

Regarding claim 28, 22.5 mol% cannot be the upper limit of the first and third oxides if their total content is less than 22.5 mol% and both must be present.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 46 is rejected under 35 U.S.C. 102(e) as being anticipated by Saak et al (US 6,844,075).

Saak teaches an intermediate layer for a coating system on a turbine component. The substrate may comprise a ceramic matrix composite, and the intermediate coating comprises tantalum oxide (in addition to alumina). There may be excess tantalum present in the coating.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 25, 26, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US 6,258,467) in view of Spitsberg (US 6,558,814). Subramanian teaches a thermal barrier comprising an  $ABO_3$  combined with zirconia or hafnia, wherein A is La, Pr, Nd, Eu, Tb, Er, or mixtures thereof. The coating may be applied to a ceramic substrate (col. 4, lines 45-50). The ranges of the instant claims are considered to overlap with the composition of Subramanian. The amount of the lanthanide oxide may be about 33 mol% or less (see conversion in the Example). Subramanian does not teach additional substrates for the turbine engine coating. Spitsberg teaches a

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coating system for a turbine engine component similar to that of Subramanian. Spitsberg teaches that the ceramic thermal barrier coating may be applied to both ceramic matrix composite substrates as well as superalloy substrates with the expectation that both types of substrates would be protected. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the coating of Subramanian to either a superalloy substrate or a ceramic matrix composite as Spitsberg clearly teaches that the ceramic thermal barrier coatings serve as thermal protection for both types of substrates.

Claims 22, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al (US 6,812,176) in view of Spitsberg et al (US 6,558,814). Zhu teaches a thermal barrier coating comprising zirconia, dopant A which may be ytterbia, or Scandia, dopant B which may be samaria, and a primary stabilizer which may be yttria. While the instant claims use the transition phrase “consisting”, the rest of the claims also use the phrase “at least one of” with reference to the choices of oxides. Therefore, the coating may actually comprise more than just one of each of the choices for oxides. The coating of Zhu may comprise zirconia, yttria, samaria, and ytterbia (base, primary stabilizer, dopant B and dopant A), while the instant claims may comprise the same since the “at least one oxide” opens the choices to more than one of the Markush groups. Zhu does not teach additional substrates for the turbine engine coating. Spitsberg teaches a coating system for a turbine engine component similar to that of Zhu. Spitsberg teaches that the ceramic thermal barrier coating may be applied to both ceramic matrix composite substrates as well as superalloy substrates with the expectation that both types of substrates would be protected. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the coating of Zhu to either a superalloy

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substrate or a ceramic matrix composite as Spitsberg clearly teaches that the ceramic thermal barrier coatings serve as thermal protection for both types of substrates.

Claims 25, 26, 28, 30-37, and 39-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al (US 5,789,30) in view of Spitsberg et al (US 6,558,814). Kondo teaches a zirconia material used for thermal barrier coatings comprising a stabilizer in an amount of 0.1-40 wt% and the balance zirconia. The stabilizer may be Scandia, lanthana, ceria, terbium, thulium, amongst others, and may be a mixture of two or more of the oxides. Regarding the mixing of two or more of the oxides, it would have been obvious to one of ordinary skill to add two or more of any of the oxides of the listing together in amounts which do not exceed 40 wt%, as it is clearly taught by Kondo that mixtures of these oxides may be added in amounts up to the maximum value. Kondo does not teach additional substrates for the turbine engine coating. Spitsberg teaches a coating system for a turbine engine component similar to that of Kondo. Spitsberg teaches that the ceramic thermal barrier coating may be applied to both ceramic matrix composite substrates as well as superalloy substrates with the expectation that both types of substrates would be protected. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the coating of Kondo to either a superalloy substrate or a ceramic matrix composite as Spitsberg clearly teaches that the ceramic thermal barrier coatings serve as thermal protection for both types of substrates.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Amano et al (US 4,774,150) in view of Spitsberg et al (US 6,558,814). Amano teaches a thermal barrier coating comprising a stabilizer which may be CaO, and an additional oxide which may be europia. The CaO

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may be present in an amount of 8 wt%, and the additional oxide may be present in an amount of less than 5 wt%. These values are considered to overlap with the ranges of the instant claim.

Amano does not teach additional substrates for the turbine engine coating. Spitsberg teaches a coating system for a turbine engine component similar to that of Amano. Spitsberg teaches that the ceramic thermal barrier coating may be applied to both ceramic matrix composite substrates as well as superalloy substrates with the expectation that both types of substrates would be protected. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the coating of Amano to either a superalloy substrate or a ceramic matrix composite as Spitsberg clearly teaches that the ceramic thermal barrier coatings serve as thermal protection for both types of substrates.

Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dorfman et al (US 2004/0197580) in view of Spitsberg et al (US 6,558,814). Dorfman teaches a thermal barrier coating material comprising zirconia and a stabilizer which may be ceria in an amount of 5-25 wt%. Dorfman does not teach additional substrates for the turbine engine coating. Spitsberg teaches a coating system for a turbine engine component similar to that of Dorfman. Spitsberg teaches that the ceramic thermal barrier coating may be applied to both ceramic matrix composite substrates as well as superalloy substrates with the expectation that both types of substrates would be protected. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the coating of Dorfman to either a superalloy substrate or a ceramic matrix composite as Spitsberg clearly teaches that the ceramic thermal barrier coatings serve as thermal protection for both types of substrates.

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Claims 33, 34, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maloney (US 6,924,040) in view of Spitsberg et al (US 6,558,814). Maloney teaches a thermal barrier coating comprising hafnia, gadolinia, and further wherein the hafnia or gadolinia may be partially substituted with oxides such as ceria, praseodymia, and neodymia. The gadolinia may be added in an amount of 3-70 mol%. Maloney does not teach additional substrates for the turbine engine coating. Spitsberg teaches a coating system for a turbine engine component similar to that of Maloney. Spitsberg teaches that the ceramic thermal barrier coating may be applied to both ceramic matrix composite substrates as well as superalloy substrates with the expectation that both types of substrates would be protected. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the coating of Maloney to either a superalloy substrate or a ceramic matrix composite as Spitsberg clearly teaches that the ceramic thermal barrier coatings serve as thermal protection for both types of substrates.

#### ***Allowable Subject Matter***

Claims 1-5, 7-10, 15-17, 19-21, 27, 29, 44, 45, and 47-55 are allowed.

Claims 14 and 18 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

#### ***Response to Arguments***

Applicant's arguments with respect to the claims rejected above have been considered but are moot in view of the new ground(s) of rejection.



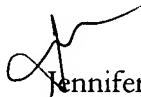
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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer C. McNeil whose telephone number is 571-272-1540. The examiner can normally be reached on 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jennifer C McNeil  
Primary Examiner  
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JCM